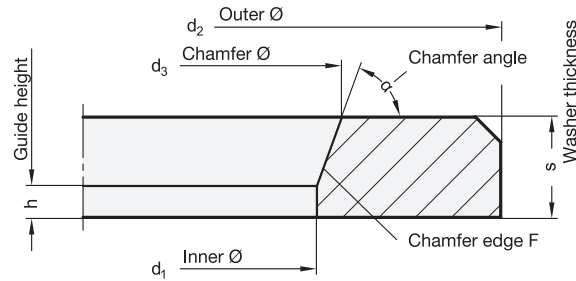


## Technical information



### Outer diameter $d_2$

The outer diameter  $d_2$  of the low type corresponds to DIN 125 / ISO 7089 washers. The high type corresponds to DIN 7349 washers.

### Chamfer diameter $d_3$

Together with the chamfer angle  $\alpha = 70^\circ$  and the inner diameter  $d_1$ , this dimension is the most important one of these heavy duty washers. Even in the lower tolerance range, the diameter  $d_3$  is generally larger than the maximum contact under head diameter on a bolt.

This will ensure that the chamfer of  $d_3$  of the hardened washer will not be pressed into the under head radius causing an indentation which would damage the bolt.

### Inner diameter $d_1$

The inner diameter  $d_1$  is kept as small as possible ensuring that the bolt is guided centrally in the washer. The choice of a matching pair of bolt and washer with least radial clearance is important in order to avoid a mismatch between chamfer diameter  $d_3$  and the maximum contact area diameter of the bolt head.

### Chamfer angle $\alpha = 70^\circ \pm 2^\circ$

This relatively large angle is necessary when using hexagon headed bolts to avoid interference with the chamfer diameter  $d_3$  of the washer.

### Chamfer edge F

The extended chamfer edge F, as seen from  $d_3$ , and  $d_1$  create an edge that provides the smallest radial clearance towards the transition from bolt shank to head. Even with the minimum chamfer angle of  $\alpha = 68^\circ$  and the smallest dimensions for  $d_1$  and  $d_3$ , this radial clearance is sufficient for all bolts according to DIN EN.

### Guide height h

This is the height of the cylindrical part of the inner diameter  $d_1$ . The dimension  $h$  should be as high as possible in relation to the thread pitch of the bolt.

### Washer thickness s

GN 6339 heavy duty washers are higher than comparable DIN washers (exception: DIN 7439 which is equal to the high type).

A larger thickness leads to a stronger washer. In addition, taking the chamfer  $d_3$  into consideration, a minimum guide height is provided which ensures that the thread will not be damaged when tightening.